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UNITED STATES DEPARTMENT OF AGRICULTURE

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MONTHLY REPORT OF THE OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

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M O N T H L Y R E P O R T

OFFICES OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

December, 1924

Foreword

"Successful investigators cannot be satisfactorily trained by extending their knowledge over too many fields of scientific inquiry. It is more important that a student should confine his efforts to a restricted field of knowledge with a view to making real contributions to the major subject. Through such intensive effort a knowledge of the methods of research and skill and experience in interpretation may be developed. Minor subjects should only be permitted for the purpose of illuminating the major problem.

"A development of the spirit of research in an institution is essential to the highest achievements. It is unquestionably true that in certain institutions a spirit of inquiry pervades which influences every man within the institution. The presence of such a spirit in an institution is of immeasurable value. Its conscious development is worthy of the careful consideration of administrative officers. After all, the real compensations which come to the teacher and the investigator are not measured in salary alone. They consist in the consciousness of a great work successfully achieved and of the appreciation of those in a position to influence greatly or control definitely the conditions under which men work.

"The agricultural experiment stations of the United States are in a sense but units of a single vast organization for scientific research. We will not have fulfilled our implied obligation to the nation if we continue to emphasize our individualistic status. We must learn to cooperate. We must conserve our resources by recognizing the nation-wide application of the efficient work of certain stations. It is not essential that every station solve every problem that pertains to agriculture. We should greatly increase the number of important projects which can be so divided that the work may be parceled out so that a single station may devote its resources to a rather restricted field.

"There can be no question but that ten stations, each working on a distinct phase of a big problem, will accomplish immeasurably more than ten stations all working on all phases of the same problem." (F.B.Mumford, Dir. Mo. Agr. Exp. Sta.)

"In the selection of research problems the immediate needs of the area served should receive first consideration. Generally these are the less technical problems in station work. They include questions of practical management, adaptation of known laws and rules to local problems, improvement of practice, and adjustments to a particular community of results already worked out. Practical help of this class builds public appre-

ciation. Stations generally have given full consideration to this phase of their work, since contact with the problems in the field tends continually to emphasize local and seasonal questions most easy of solution, throwing more technical problems into the background.

"The Progress of station work continually calls attention to the many problems in so-called pure science which may be and actually are of prime importance. The station which does not carry its full share of such technical problems will find as the years pass that it is less and less able to deal with the immediate problems of plant development, soil management, disease, control, etc. While the number of such technical problems under investigation at any one station should not be large at any one time, each department of the station work may well have under consideration one or more such projects, which can be answered when public demand for such information becomes pressing.

"In the selection of a project the following questions might be asked:

"Will the solution of this project be followed by improvement of methods and material benefit?

"To what extent will the industry be benefited?

"Has this project already been solved by some other station, or have the foundations for its solution been laid elsewhere?

"Is the problem actually capable of solution when submitted to scientific methods?

"Has the station the means to carry this project to a final solution?

"Is the staff available or can suitable persons be secured for this work?

"I have put this general analysis of the problems of research first because it seems desirable to have a comprehensive survey of the field itself before a corps of investigators are assembled with which to attack these problems.

"The station staff should make a critical analysis of the problems of the region and determine their relative importance. The staff might be assisted in the selection of projects by calling in counsel.

"The leading members of the station staff should be men of considerable experience in research. Their efficiency will be greatly increased if they can have associated with them younger men, well trained in fundamental science, who have sufficient personal knowledge of their problem to carry the details of its investigation under proper supervision.

"The question as to what constitutes sufficient fundamental training to undertake lines of investigation is a very live problem. The average young man entering college is wont to inquire what opportunity, measured in dollars, is open to him upon the completion of his course. If he

has come up through the farm environment he is likely to give altogether too much emphasis to so-called practical subjects, and altogether too little emphasis to fundamental training in the sciences, such as would make him available for scientific research. The man well trained in science and able and willing to read the literature in scientific fields, both in his own language and in foreign languages, has a very decided advantage over the man of less systematic training, even though his contact with the problem may be more limited. A Bachelor's or Master's degree does not guarantee ability in research. Research workers must be selected with the most critical discrimination and care if real progress is to be made in this field.

"Personality and genius in investigation are important. Coupled with systematic training they represent the highest qualification of an investigator. The former will always be a driving force, and the latter the means - the tools with which to reach achievement. Genius and personality without systematic training are not likely to bring large achievements in research."--E. A. Burnett, Dir. Neb. Agr. Exp. Sta.

(From a discussion on the "Problem of Research in a College of Agriculture.)

FOREST EXPERIMENT STATIONS

Washington

Congress convened in December and proceeded to deal with the Agricultural Supply Bill among the first items after the Budget had been released by the President. The bill was reported out of the House Committee promptly, passed, and referred to the Senate and has since been passed by the Senate without changes in the item for Silvical Investigations, 1926. It is now before the Conferees. An increase was provided by the Senate Committee in the item for forest insect investigations, and a proviso was also inserted limiting the expenditure for forest pathological work at the experiment stations. A bill was introduced by Senator Pepper, providing for a forest experiment station to serve Pennsylvania and surrounding States. Bills were also introduced by Senator Shortridge and Representative Lineberger for a forest experiment station in California.

The annual meeting of the Association for the Advancement of Science was held in Washington the last of December, and the annual meeting of the Society of American Foresters was held at the same time. This provided an excuse for many men in forestry work and in other lines of scientific endeavor to visit Washington. Among those from the forest experiment stations were Zon from the Lake States; Dana, Stickel, and Behre from the Northeast; Frothingham, Korstian, and Haasis from the Appalachian. Most of the men stayed over a few days to take up various matters with the office here and to consult with men in other activities.

Show, from District 5, arrived the middle of the month for a detail of about two months, during which he will spend a considerable portion of his time upon the development of standard methods for appraising forest

fire damage. He plans also to undertake the final revision of the requirements report with the Editor before returning to California. On the way east he stopped at the Pacific Northwest, Priest River, and Lake States Stations. He plans to return through the Appalachian, the Southern, and the Southwestern Stations.

The meeting of the Society the last of the month offered a possibility for getting together the Committee on growth and yield. Unfortunately, the program for the week was so full and the men had so many diverse interests at the time that it was impracticable to get the Committee together for a thorough discussion of the problems of getting out a standardized work. Outside of the members of the Forest Service, Prof. Chapman was the only member of the Committee present.

During the month the Secretary appointed 22 members of the Appalachian Forest Research Council, among whom are Directors of Agricultural Experiment Stations, Presidents and Deans of Colleges, timberland owners and operators, and other interested individuals.

During the month the Civil Service Commission informed us that 11 men had taken the Silviculturist examination, 13 the Associate Silviculturist, and 8 the Assistant Silviculturist. The examination closed November 11.

A record has been made of the arrival of the monthly reports from the experiment stations, following complaints made from time to time that the monthly report does not get to the field soon enough. An analysis shows that though the average date on which the reports were received is the eighth of the following month, nearly every station at one time or another sent in its report after the 20th. The date of appearance of the combined office report from Washington is determined by the last station report to arrive from the field. In the preceding six months the last station report in each case reached here 15, 20, 21, 23, 24, and 26 days after the end of the month covered by the report. With the submission of station reports delayed as long as this, it is impossible to get the material mimeographed here in time to reach the field short of six weeks after the month for which the reports are made. We hope that the Stations will endeavor to get their reports to this office as soon after the first of the month as is possible, and in any case not later than the 10th.

In the Tabulation Division, the southern pine growth study occupied 9 per cent of the time, the economic studies in logging and stumpage prices 54 per cent, and the fire studies for the Northeast and Priest River each 10 per cent.

Most of the work of Miss Meynes during December was upon completing the apportionment of the road fund in accordance with the resources and values of the National Forests involved.

In the Section of Computing, 35 per cent of the time of the available members of the section was devoted to coding the Massachusetts fire

reports, 24 per cent to the southern pine growth study, and with some additional work including checking examination papers for scalers, and in checking manuscripts.

THE EDITOR'S OFFICE

While we are on the subject of illustrations, as we were last month, and while we all are reading Bulletin 1294, "Role of Fire in the California Pine Forests," in response to Colonel Greeley's request, it may be well to look over rather carefully the illustrations in this bulletin to see how closely they approach some of the recommendations made in these pages. While these illustrations certainly might have been improved, had the authors as deliberately photographed their subject as they studied it in every other way, the illustrating of this bulletin represents about the best that those who had a part in the final preparation of the bulletin for publication could accomplish with the material in hand.

As a whole these illustrations tell a fairly complete story of the subject of the bulletin. The frontispiece gives it in a nutshell; then come views showing the various effects of fire, in fire scars, in burning down, in loss of the best wood in the tree, in heat killing. Then are contrasted its effect in the virgin forest and in second growth. Follows a before-and-after of broadcast slash burning, with photos in the next three plates showing the development of brush fields. Here the tide turns and Plate X tells the other side of the story, the possibility of the forest returning and reclaiming the land under protection. The next two plates deal with light burning, and the last two take up slash burning again, showing both damage from broadcast and approved forms of disposal of brush and snags. More of the major points of the bulletin would have been covered if photographs had been available. Only a thorough ransacking of the files made the present collection possible. This brings out an important point: When the report is written it is too late to go back and photograph scenes desirable for illustration, except in rare instances.

The titles of the photographs in Bulletin 1294 follow consistently the form of a brief caption in large type with a short explanation following in fine type. The explanation, too, is brief, and only in four instances runs appreciably over three lines. The large type caption calls, or should call, instant attention to the feature emphasized. This is important. You have more than once handed to a seemingly intelligent person a photograph in which some amusing, interesting, or otherwise significant feature seemed to stand out so clearly that no comment was necessary; and you have been chagrined to have the other fellow mistake your meaning and come back with a comment on an entirely different feature. That is just what the reader of your bulletin tends to do. If you show him a picture of a ranger standing in an opening, with brush in the foreground and trees in the background, tell the reader quickly whether you expect him to be edified by the brush, the trees, or Ranger Bill. Plate V, Figure 1, errs in this respect. It achieves partly in calling it to your notice that this open growth is typically virgin forest, but only by implication and therefore with not sufficient directness. Figure 2 is unmistakable at first glance to the most casual reader by reason of a brief, direct, complete caption.

Plate X, Figure 1 is not explicit enough either. In some definite way, either in the caption or sub-title, it should state clearly that the black spots in the foreground constitute the young growth mentioned.

Plate XII, Figure 2, in the editor's opinion, is not a satisfactory photograph. All of the things said for it may be there, but they have to be imagined. The large pine referred to can be seen, but you must take the word of the Department of Agriculture for it that it was burned down in the course of repeated light burning; and that is what the gentlemen at whom this bulletin is aimed are disposed to do almost anything else in the world but.

Most, if not all, of the other pictures tell their own story, with the help of adequate titles. Opinions may differ on this, however, and it will be helpful if everyone contemplating an illustrated bulletin or circular in the near or far future will edit this collection of views freely. Criticisms are welcomed.

DENDROLOGY

Extended Range of Shasta Red Fir

The Shasta Red Fir of the California Sierras is now known to occur extensively also in the lower Sierra Madre in the State of Michoacan, Mexico. Previously the Shasta Red Fir (Abies magnifica shastensis) had been found only in southern Oregon, and in northern and southern California on the high slopes of the Sierras. It was described first from the upper slopes of Mt. Shasta, where it grows plentifully. The existence of this fir in southwestern Mexico was recently determined by an examination of the wood, foliage and mature cones supplied by Mr. C. H. Forbes Morrison, Tinquidin, Michoacan, Mexico, who owns a tract containing some 500 million board feet. Locally the timber is known as "Pinabete."

Mr. Morrison writes that in Michoacan this fir attains a height of over 100 feet and a diameter from 3 to 5 feet. He is endeavoring to interest American capital in establishing a plant on his tract for the manufacture of wood pulp. Water power available is estimated for the driest period in that part of Mexico at 1,000 horse power.

In addition to "Pinabete," Mr. Morrison's tract contains large quantities of a large timber oak locally known as "Encino blanco," which he says is used extensively for railway ties. The foliage and wood indicate that the tree is not a white oak, but a black oak of unusual commercial quality.

Extended Range of Eastern White Pine

Until recently the range of our Eastern White Pine was known to extend roughly from Newfoundland to Manitoba (southern end of Lake Winnipeg) and southward through northern United States and in the eastern mountains to northern Georgia. Mr. W. T. Cox, formerly State Forester of Minnesota, recently discovered two small isolated bodies of this pine at points considerably north of the north end of Lake Winnipeg. One of these bodies

lies northwest of Lake Sipiwesk, and the other lines to the northeast of this lake. This discovery extends the range of White Pine roughly about 200 miles farther north in Canada than it was previously known to extend. Mr. Cox found this pine recently while he was making an aeroplane reconnaissance of pulp wood timberlands in the region southwest of Hudson Bay.

APPALACHIAN FOREST EXPERIMENT STATION

General

Work on current projects occupied most of the month, and progress was made on reports for the studies of fire damage, southern white cedar, and the Biltmore Plantations. Miss Stabler completed her assignment and returned to Washington. A brief visit by Professor Mulford was made the occasion of a luncheon, tendered by McCarthy, at which most of the members of the two forestry offices at Asheville were present. Meetings of the American Association for the Advancement of Science and affiliated societies at Washington were attended by Frothingham, Korstian, and Haasis.

Fire Weather (Pf-2)

On examination of the weather records for the months of October and November, McCarthy found reason for the current belief that conditions during the fall fire season had been even more severe in this section than in the fall of 1922. Rainfall was extremely deficient and atmospheric moisture very low - lower than in 1922 and for a longer period of time. The percentage of possible sunshine for October and November combined was higher than for any similar period since 1911. A condition of high barometric pressure was maintained over this region practically throughout the fire season. Dry weather continued in December after a week of some rainfall. No snow has fallen to the end of the month around Asheville.

Fire Damage (Pf-4)

Work on the fire damage project makes it obvious that appraisal must take into consideration qualitative damage to the forest, since the recuperative power of this hardwood forest resists complete killing and fills the woods with crippled trees, poor species, and clumps of sprout regeneration.

Examination of Planting Experiments in the Spruce-fir Type (Fp-2)

Korstian and Reineke made a detailed examination of the twenty-eight planted sample plots on the Clingman planting area in the Black Mountains. This included the first height measurements of the planted stock. The stock planted last spring is reported in good shape, and evidence was found to indicate the superiority of the mattock method of planting over the shovel method which had been used to some extent.

Forest Types of the Southern Appalachians

An agreement as to a forest type classification for the Southern Appalachian and adjacent regions has been reached by a special committee of the local section of the Society. Considering the extensive area, the large number of species and the marked altitudinal and climatic differences within the region, it is rather remarkable that the committee has been able

to work out a series of as few as twenty-eight forest types. Fifteen of these are characteristic of the mountains, six of the plateaus, and seven of the Coastal Plain.j The committee, consisting of State Forester Holmes, W. J. Damtoft, and Frothingham, McCarthy, and Korstian of the Station, will present its report for action at the winter meeting of the Section. In the meantime the type list, with descriptions, will be circulated for criticism.

LAKE STATES FOREST EXPERIMENT STATION

The meeting of the Advisory Council of the Station will be held in Chicago on January 23. Almost all of the members of the Council have signified their intention of attending the meeting. It is on the day following the meeting of the American Forestry Association so the members of the Council will have an opportunity to attend the Association meeting. Some time has been spent in the preparation of the preliminary draft of the Station's annual investigative program.

The Department of Conservation of Michigan called a meeting during the month in Lansing to consider points in a State conservation policy. Representatives of different organizations and individuals were invited who are interested in conservation in the State. The object was to secure constructive suggestions as to development of the conservation policies. Zon attended as a representative of the Station. Mr. Herbert Smith also attended as a representative of the Washington office. As a result of the discussions and suggestions made, a set of resolutions was adopted covering the following points:

1. A forest tax law reducing the rate of taxation on lands with growing timber.

2. Extension of forest fire protection through increased State appropriation, creation of a State emergency fund, enactment of a law to enable the Governor to prohibit smoking in the woods at his discretion, better law for the control of railroad equipment for the prevention of fires, and enactment of a slash disposal law.

3. The distribution of Federal Forest planting in Michigan over different parts of the State in place of concentration at one or two localities.

4. A law enabling the State to purchase lands on which there is standing timber and contract with the owners to log them according to State recommendations, thus avoiding disastrous slash fires and providing for natural reproduction.

5. Creation of additional State forests and an extended program for their improvement.

6. The State was urged to plant 15,000 acres of pine seedlings each year.

7. Cooperation with the Lake States Forest Experiment Station.

Mr. Smith returned to St. Paul with Mr. Zon and spent a day at the Station discussing with the Director and W. T. Cox matters of State policy and public relations in Minnesota.

The current projects of the Station made some progress during the month. In the jack pine yield project the volume tables are almost completed.

A. O. Benson of the Forest Products Laboratory visited the Station to discuss a new project on the profitability of logging different sizes of trees in the maple-birch-beech-hemlock forests. The project as outlined would cover different degrees of partial cutting, costs of logging trees of different sizes, and the products which can be sawed from trees of different sizes in the mills and their value. The proposed project would be financed and carried out in cooperation between the Laboratory, the Northern Hemlock & Hardwood Association, and the Experiment Station. It has been taken up in a preliminary way with the association.

Good progress has been made in bringing up to date clerical work by the appointment of Miss E. J. Peck.

Zon left December 26 to attend the meeting of the American Association for the Advancement of Science, and of the Society of American Foresters in Washington.

Dean Hugo Winkenwerder of the School of Forestry of the University of Washington spent part of a day in the office during the latter part of the month. S. B. Show of District 5 stopped off on his way to Washington for a detail.

NORTHEASTERN FOREST EXPERIMENT STATION

There were no startling developments during December. Practically the entire month was devoted to working up the data secured on the various projects during the past field season. All of the cores taken in connection with the spruce yield study, amounting in all to about 3,500, have now been counted and attention is being turned to other phases of the work. A recommendation that volumes be determined from taper tables prepared from Behre's formula has been forwarded to Washington.

Westveld gave a talk before the Forestry Club of the Michigan Agricultural College on the Northeastern Forest Experiment Station. He had intended to give a boost to the Lake States Experiment Station, but found that previous activity on the part of the indefatigable director of that Station had rendered it unnecessary. Dana spoke before the Massachusetts Forestry Association, the Gardner Boat Club, the Forestry Club at Cornell University, the group of Research Workers at the New York State College of Agriculture, and the Society of American Foresters. The office was almost completely deserted the last of the month as a result of leave and attendance by several men at the Society meeting in Washington.

SOUTHERN FOREST EXPERIMENT STATION
(November and December)

General

Mr. Wakeley, whose temporary appointment as Student Assistant was noted last month, was given a permanent position on the staff as Junior Forester beginning November 12. Mrs. Alicia P. Nolan took Miss North's place under temporary appointment early in November, and she and Miss

Spuhler have both been very busy on correspondence and typing of accumulated reports. Louis M. Reynolds, Jr., who still has a year's work in forestry to complete at Cornell, and John B. Byrne, a graduate of the California Forest School, with considerable field experience in the Forest Service, were given temporary appointments as field assistants during the month.

Forbes spent a good many days on the annual investigative report and proposed program, which was forwarded to Washington on the 10th of December. He also put in final shape his memorandum on the proposed Advisory Council and prepared a schedule of work for all members of the staff up to July 1. As chairman of the Publicity Committee of the Southern Forestry Congress, he wrote a few letters advertising the Seventh Congress at Little Rock, but could not spare time to do a job in keeping with the importance of this organization.

Striking proof that the South is beginning to look to the Station for information in forestry is seen in requests for some one to visit four different forest properties and advise as to its protection against a variety of enemies. Our own experimental areas have been frequently jeopardized by fire this fall. Hine reports that only great vigilance and the most strenuous efforts of our cooperators and friends at Urania have prevented fires from entering every one of our experiments.

Forbes wrote an article entitled "Rambling Advice to Possible Foresters" for the Cypress Knee, published by the Georgia Forest School, and another on the "Growing of Pulp Wood in the South" for the Christmas issue of the Southern Lumberman. The process newly announced by the Madison Laboratory for making news print out of light colored hardwoods, of which the South has a very abundant supply, has caused a sudden and widespread interest in pulp manufacture in the South. This process may have the most far-reaching effect upon southern forestry.

Wyman addressed the monthly meeting of the Alabama Turpentine Producers Association at Mobile, in December, and reports that contrary to his expectation the majority of the men present were interested in second growth.

Although they did not visit the New Orleans office, the large number of foresters attending the annual meeting of the Association of State Foresters saw something of our work at Bogalusa and Urania.

Protection

Fall burns were made in the loblolly plots at Urania and the longleaf plot at McNeill. Hine found that the spring burn this year had killed practically all the loblolly pines up to five feet in height.

The Carolina Fibre Company, which owns 8,000 acres around Lanes, South Carolina, has protected its holdings quite successfully for three years, but has become apprehensive lest continued protection should result in increased hazard and possible disastrous fires. Upon learning that the company planned to try "light burning" of a small area this year,

we offered to make a careful study of the effect of such burning. The company acquiesced readily, and Hine laid out a 20-acre plot to be burned, and two 2½-acre check plots.

This study gives every promise of yielding extremely valuable data. It is a new angle of approach to the problem of fire damage, which we have hitherto studied only on plots of 1/4 acre or less. Fires either do not gather sufficient headway in so small a space to produce typical effects, or do not burn as uniformly as they should.

Measurements

Under Hine's direction Averell and Tinker set to work in Arkansas to measure the 100 shortleaf pine yield plots which are still needed. Abundant stands of excellent shortleaf pine were found in the vicinity of Crossett and Warren, and after Hine left them the student assistant crew moved to southwestern Arkansas, where typical stands were found on poorer sites. Forty plots in all were obtained in the State, and the crew then went to Watertown, Florida, to measure slash pine for a strengthening of the volume table. Shivery, Reynolds, and Byrne obtained some volume table measurements, chiefly of slash pine, in St. Tammany Parish, Louisiana, and in the course of thorough search for suitable stands along the Mississippi Coast measured six additional slash pine yield plots. About 25 additional loblolly pines were measured for volume by Hine and Averell in north Louisiana. A nearly complete set of both volume and yield tables for longleaf and loblolly pine was completed in the Branch and sent to us for comment. They are the final fruit of a staggering amount of work, both in the field and in the office.

Management

Several of our necessarily neglected management projects received attention, particularly good progress being made in the method-of-cutting study at Bogalusa. Shivery, Byrne, and Reynolds worked uninterruptedly on the 200 acres since December 4, except when heavy rains or severe cold interfered.

Wyman at length found time to complete the revision and check of the report on establishment of the brush disposal project at Urania. This has been a very large and long-drawn-out job; the punch card machine will in the future greatly reduce the work on projects of this kind.

Shivery reexamined the natural reproduction longleaf plots on the Florida Forest, and found that the past 16 months have increased slightly the proportion of seedlings growing in the shade of scrub oak to those growing in the open. This ratio was about two and a half to one at the time the project was established, when the seedlings were 18 months old.

The ten-year remeasurements of the four sets of thinning plots in shortleaf and loblolly pine at Urania were made by Averell and Tinker under Hine's direction. Further thinnings were deferred pending a careful examination of the data and the adoption of a consistent program with respect to degree of thinning.

A working plan for extensive surveys of old cuttings, as a supplement to the permanent sample plots hitherto exclusively used in studying natural reproduction and methods of cutting, was drafted by Forbes and submitted to the Appalachian Station, which will cooperate with us when our crews reach North Carolina and Virginia some time in the spring. The Appalachian men on the basis of considerable recent experience recommended that sample plots at intervals along compass courses be substituted for continuous strip. The revised plan as submitted to the Branch was something of a compromise on this point; tally sheets are to be changed at frequent intervals, so that the strips may be regarded either as continuous or as aggregates of sample plots.

Naval Stores

The last dip, except for one group of trees in the season-of-chipping test, was made at both Powell's and Sampson Lake. Cups were removed, and the orchards raked and burned under Wiswell's direction after Wyman left for New Orleans. The wery lengthy job of tree description, including cone counts on both the chipped trees in our tests and some round timber adjacent, was finished at Powell's, and some progress was made in the slash tract also.

Wyman and Wiswell spent four days at Woodbine, Georgia, making some stem analyses and obtaining other data on an important test of Dr. Cary's. On his way to New Orleans Wyman stopped off a day in Mobile and joined Miss Gerry on an interesting field trip. Miss Gerry has undertaken to keep up much of Mr. Cary's work during his recent illness, and completed her southern field trip on November 24.

The ground work was laid for a better coordination of the work of the various units of the Forest Service working in naval stores, which should result in our obtaining more effective support from the industry itself for the work of all units.

Forestation

Highly satisfactory progress in all phases of the work is reported from Bogalusa. For the first time we feel that we are in a fair way to obtain reliable data on viability of seed and to develop the technique of seed testing. Hadley's dry kiln has supplied us with seed extracted under a variety of temperatures. In addition to a few seed tests of his own at Bogalusa, Hadley has under way a considerable volume of cooperative work at the universities of Louisiana, Georgia, Oklahoma, and North Carolina. Our chief dependence, however, will be the very promising cooperation of Miss Koch in New Orleans, who visited Bogalusa in order to acquaint herself with our forestation program in general, and who has undertaken in a very thorough way the test of a large number of seed samples furnished by us. She will use several types of germinators.

The November and December sowings of seed were made in our Bogalusa beds by Hadley and Wakeley. Longleaf had germinated from the earlier sowing in considerable numbers when a severe cold snap hit Bogalusa and frost

raised the entire sand covering of the beds to a height of nearly an inch. Wakeley does not feel that the longleaf seedlings have been seriously injured by this phenomenon.

The Great Southern Lumber Company has set aside for our use a ten-acre planting site along the main highway three miles west of Bogalusa. This will be planted with stock from our own and the Great Southern nurseries in a wide variety of tests. Season-of-planting plantations of longleaf, loblolly, and slash were made in December. Hadley and Wakeley have been making recounts of earlier plantations both at McNeill and Bogalusa.

Protection, other

Insects. Unprecedented drought suffered by south Mississippi, Louisiana, and Texas from early in June until the end of November has apparently given the bark beetle Ips a Roman holiday. These insects, which ordinarily are not able to overcome live trees, have been extremely destructive this summer. Mr. R. A. St. George, of the Bureau of Entomology, spent several weeks in our territory and reported the loss of 50 million feet of pine timber in Texas, and 10 to 15 million feet in west Louisiana. Because much of the affected timber was being turpentined the Turpentine and Rosin Producers Association made a special plea to us to have Wyman accompany St. George in west Louisiana and advise as to what should be the turpentine policy next year. These investigators found that the poorer soils were notably hard hit and that chipped trees suffered somewhat more heavily than round timber. Continued abnormal weather was a factor which neither man was willing to gamble on, so that only the most general advice was given. St. George's visit stirred up a large interest among both the lumbermen and the State foresters in the possibility of systematic entomology work in the South.

Disease. Two or three instances of the dying of hardwood timber have been reported to us within the past year from the Alabama River and the Pearl River bottoms. Shivery visited the former near Stockton, and found losses which could not well be ascribed to the overmaturity of a considerable portion of the forest. Many young oaks were found to be exuding fermented sap from lesions near their bases. A sample from one tree was sent to the Bureau of Plant Industry for a determination of the nature of the injury. Mr. St. George agreed with us that such insects as were present were probably secondary. Although Shivery could find no evidence of fire, the specimen he obtained showed some injury in 1922 from an undetermined cause.

PRIEST RIVER FOREST EXPERIMENT STATION

With three members of the staff on annual leave during the latter half of the month, there was comparatively little activity in office work during December.

Gisborne's manuscript for publication on the progress of fire studies was reviewed by Flint and Weidman. This will now be revised by Gisborne for submission to the Forester. Material for the annual investigative meeting was prepared by Weidman. A preliminary report on accelerated growth in western white pine after cutting was finished by Haig.

Haig's report covers a short study of several old timber sale cuttings on the Coeur d'Alene Forest. The conditions studied embraced partial cutting in which a considerable number of white pine reserved trees were left. The objects were to determine the amount and character of reproduction and the existence of accelerated growth in remaining trees. So far only the field data on accelerated growth have been worked up. The preliminary results may be stated as follows: Western white pine does make accelerated growth after partial cutting. The response, however, appears to be relatively greater in the smaller and more suppressed trees than in the larger trees. Also, there is very little response in trees that are slightly lacking in health and vigor. In general, western white pine appears to be much less aggressive in responding to stimulation than western yellow pine. In view of all this, it is clear that further study is necessary before the value is ascertained of leaving large white pine trees in partial cutting with the object of securing accelerated volume growth.

One of the old timber sales studied (the Ryrie-Wright sale cut 15 years ago) fortunately contains a permanent sample plot established by Brewster. This made possible an interesting study of loss, as well as of increased growth. This was a true partial cutting in which 35 per cent of the stand by volume was reserved, including white pine trees up to 24 inches d.b.h. The reserved white pines comprised 11,860 board feet per acre. An examination of the plot 5 years after cutting showed a loss of 25 per cent of these remaining trees. The present examination 15 years after cutting shows this loss to have reached 46 per cent. The losses were caused by windfall, logging and brush burning damage, and possibly also such damage as this species might experience from sudden and unaccustomed liberation following heavy partial cutting. It is particularly interesting to note that, although 11,860 feet in white pine trees were reserved at the time of cutting, the best that can be expected on the ground 30 years after cutting, assuming the present rate of growth and no further losses, is 11,508 board feet per acre in merchantable white pine. In other words, the losses on this area have already more than offset the increment that can be expected in 30 years.

At Savenac Nursery Wahlenberg devoted the month to compilation of field data, summation of results for the annual investigative meeting, and to reference reading.

At the field station Kempff felt the brunt of the severely cold and stormy weather in a number of ways. December this year brought us a spell of 10 days of weather in which the mercury rarely went above zero and was several times as much as 20 degrees below zero. This, together with the high winds, meant that considerable time had to be spent on a frozen water system and down telephone lines. With the help of a temporary man, the height measurements of the thinning plots were finally completed during the zero weather. A fairly good start was made on the office work of this project.

FREMONT EXPERIMENT STATION

Aside from a week spent by Roeser in tagging the Douglas fir thinning plots in conjunction with Forest Examiner Keithley on the Pike, there has been very little activity in the field. With this tagging, all permanent sample plots have now been brought up to existing standards of completeness, in practically every important particular. This closes a season of unusual activity in this line. Likewise the month of December has been one of unusual activity in working up sample plot data, in part toward the preparation of a complete growth study report, and in part toward supplying the increment data needed for Show's fire-damage appraisal study. We can now point to several authentic records, in spruce and lodgepole stands of increments exceeding 80 cubic feet, under conditions which undoubtedly prevail over extensive areas. This indicates that the slow growth of individual trees, which is more or less the rule in D-2 forests, is no measure of the productivity of the stands, which are likely to be overstocked rather than understocked. Some progress was made toward preparation of the annual investigative program, about half the projects being covered.

The Colorado Springs branch of the Colorado Mountain Club held their New Year "watch party" at the Experiment Station, 20 members attending.

January Plans

The first work in order is the completion of the investigative program for the meeting of the District Investigative Committee at Denver on January 22. Owing to the fact that a number of events of interest occur at Denver during the week 19-24, it is considered best to have the meeting at that late date. After completion of the program, work on growth and management data will be resumed.

Three somewhat related projects will probably demand attention. These are (1) preparation of a leaflet describing the work of the Station, for public distribution; (2) preparation of a history of the Station for the "Annual" of the local newspaper; and (3) preparation of a slightly different history to be incorporated in the file historical record of the Pike Forest.

SOUTHWESTERN FOREST EXPERIMENT STATION

A thinning plot in second growth yellow pine on the Prescott was laid out and marked, with the assistance of local rangers. Conditions on the Prescott are unique in that there is a possibility of developing a local market for material removed in thinnings. The plan is to make a sale of the trees marked for cutting. All material is to be removed before June 1st as a precaution against bark beetle attacks.

Office work during the month was considerably handicapped by the absence of a clerk. Forest Clerk Hedlund, who for two years has rendered faithful and efficient service, has been obliged to take a furlough on account of his health. The position is now filled by A. A. Riley under temporary appointment.

Pearson left Flagstaff on December 29th for Albuquerque, where he will remain until about April 1st. After disposing of the annual report of the District Investigative Committee, he will cooperate with March in revising the Minimum Requirements report, and after that a bulletin on Forest Types.

PACIFIC NORTHWEST FOREST EXPERIMENT STATION

No field work was done during the month by any of the Station's force. The entire month was devoted to office work and, in the case of several, to annual leave. McArdle was unfortunately on the sick list for over a week.

The Director attended the annual White Pine Blister Rust Conference in Seattle en route to Vancouver, B. C., to the annual meeting of the Western Forestry and Conservation Association. The latter meeting had a large and representative attendance throughout the three days and interest in the discussions was lively and well sustained. More time was devoted than ever before, both in the sessions and outside, to forestry measures beside fire prevention, showing the growing interest by the industry in reforestation and its technique. A paper by a camp foreman on his slash disposal experience was illuminating in showing how far one big company is willing to go on its own lands to do controlled and regulated broadcast burning (in the spring), spending $2.00 per acre therefor without any apparent reluctance. Papers on the forest research of the several organizations were presented by Mr. Jacobson of the Western Forestry and Conservation Association, Mr. Alexander of the B. C. Forestry Branch, and the Director for this Station. A resolution was passed by the conference commending the establishment of the station, urging continuing liberal appropriations, and suggesting the creation of another station to serve the pines and redwood forests of California.

While in Seattle the Director called on Messrs. Lyford and Thrane of the J. D. Lacey Company and got helpful suggestions as to the field of research these gentlemen thought the Station should cover first.

A day and a half were spent with Show as he stopped over in Portland en route to Washington. With McArdle and Lawrence Merriam of Mason and Stevens, he drove out twenty miles to see some of the second growth Douglas fir stands we have been measuring this summer, particularly where a sawmill is at work in a 43-year old stand.

Simson has prepared a report describing the method he used to predict minimum temperatures on nights of frost danger for the use of the Wind River Nursery. He is now preparing the master chart of weather of the past season at Wind River to use as the basis for the analysis of his static observations and behavior of fires studied.

Isaac has been devoting most of his time to writing up progress or final reports on various minor nursery experiments, for which uncompiled records have been found.

Progress has been made in the preliminary computation of the Douglas fir yield study. The 1700 original tree analysis sheets made in 1909 are being checked preparatory to revising the second growth volume table to take account of changes in form that may accompany changes in age, site or crown class. Methods have been so inadequately standardized or described, and there are so many gaps in our knowledge of the laws that underlie forest mensuration, that much study and discussion of methods is necessary, and considerable statistical experimenting.

Munger has put in all his "spare time" on the final revision of the minimum requirements and desirable practice reports.

DISTRICT 5 - CALIFORNIA DISTRICT

Show left December 1 for a two-months detail in Washington to undertake the formulation of standards for fire damage appraisal. He attended some of the sessions of the Western Forestry and Conservation Association meeting in Vancouver, returning to Portland for a short time and then proceeding east, visiting the Priest River and Lake States Stations en route. Ayres continued work on the site class volume tables for mature timber.

T. C. West, on detail in the District Office, has been assigned to a study of early fire history, the material to be used to stem the rising tide of light burning enthusiasm. All available authentic records of early explorers, botanists, mission founders, early newspapers, etc., are being examined to throw some light on the fire history of the pine region prior to administration by the Forest Service. Briefed or quoted authentic material will be assembled to be used in refuting the claims of burning advocates. A large amount of scattered fragmentary material will thus be catalogued and made available.

From West's work it becomes more and more evident that there was little systematic burning by the Indians, that the number of fires set by Indians by chance or intentionally has been greatly exaggerated, and that these Indian fires were ineffective in the prevention of terribly destructive summer fires. The advent of the immigrants, miners and stockmen, marks the real beginning of destructive man-caused fires in California. Practically all the reliable testimony of early writers agrees as to the immeasurable damage done by these fires to merchantable timber.

Miss Vinther has been working upon the measurement of several hundred increment cores taken from early cutting areas on the Sierra. From the data secured it is hoped to strengthen the set of curves recently prepared for the prediction of the second cut on timber sale areas.

Dunning has been occupied in compiling field data taken in the methods of cutting, thinning, fire damage and yield studies.

LIBRARY

In December there were 1020 books and periodicals loaned from the library, and 105 members of the Service and others visited the library in person.

During the month 336 books and periodical articles were indexed and cards for them filed in the catalogue.

In accordance with a general plan to work up worth while bibliographies of interest to the stations, about 500 titles have been secured upon growth and yield for the Mensuration committee.

MANUSCRIPTS RECEIVED

"Progress Report on the Natural Reproduction Longleaf Plots, Florida National Forest." G. B. Shivery.

"Report on the Establishment of Natural Reproduction Plots in Loblolly and Shortleaf Pines and Mixed Hardwoods." W. R. B. Hine.

"Report on Comparison of Different Classes of Stock, Slash." E. W. Hadley.

"Report on Time of Planting, Longleaf." E. W. Hadley.

"Report on Time of Planting, Slash." E. W. Hadley.

"Report on Method of Planting, Longleaf." E. W. Hadley.

"Report on Method of Planting, Slash." E. W. Hadley.

"Report on Spacing to Use in Plantations, Loblolly." E. W. Hadley.

"Report on Soil Cover Tests." E. W. Hadley.

"Report on Tests for Control of Weeds and Damping off." E. W. Hadley.

"Report on Density of Sowing Tests." E. W. Hadley.

"Report on Mulching Tests." E. W. Hadley.

"Report on Time of Sowing Tests." E. W. Hadley.

IN PRINT

Korstian, C. F. Density of cell sap in relation to environmental conditions in the Wasatch Mountains of Utah. J. A. R. May 31, 1924.

Munns, E. N. Effect of fires in pine forests of California; (A Review.) Indian Forester, October, 1924.

Larsen, J. A. Some factors affecting reproduction after logging in northern Idaho. J. A. R. June 14, 1924.

Korstian, C. F. Growth on cut-over and virgin western yellow pine lands in central Idaho. J. A. R. June 14, 1924.

Roeser, J. A study of Douglas fir reproduction under various cutting methods. J. A. R. June 21, 1924.

Wyman, L. How fast should a face be raised in chipping timber. Southern Lumber Journal. October 15, 1924.

Haig, I. T. Application of Normal Yield Tables. Journal of Forestry, December, 1924.

Frothingham, E. H. Some silvicultural aspects of the chestnut blight situation. Jour. Forestry, December, 1924.

Stickel, Paul W. (and R. C. Hawley). Grazing of cattle and horses in pine plantations. Jour. Forestry, December, 1924.

Pearson, G. A. Studies in Transpiration of Coniferous Tree Seedlings. Ecology. October, 1924.

Show, S. B. and E. I. Kotok. Role of Fire in the Pine Forests of California. Dept. Bul. 1294.